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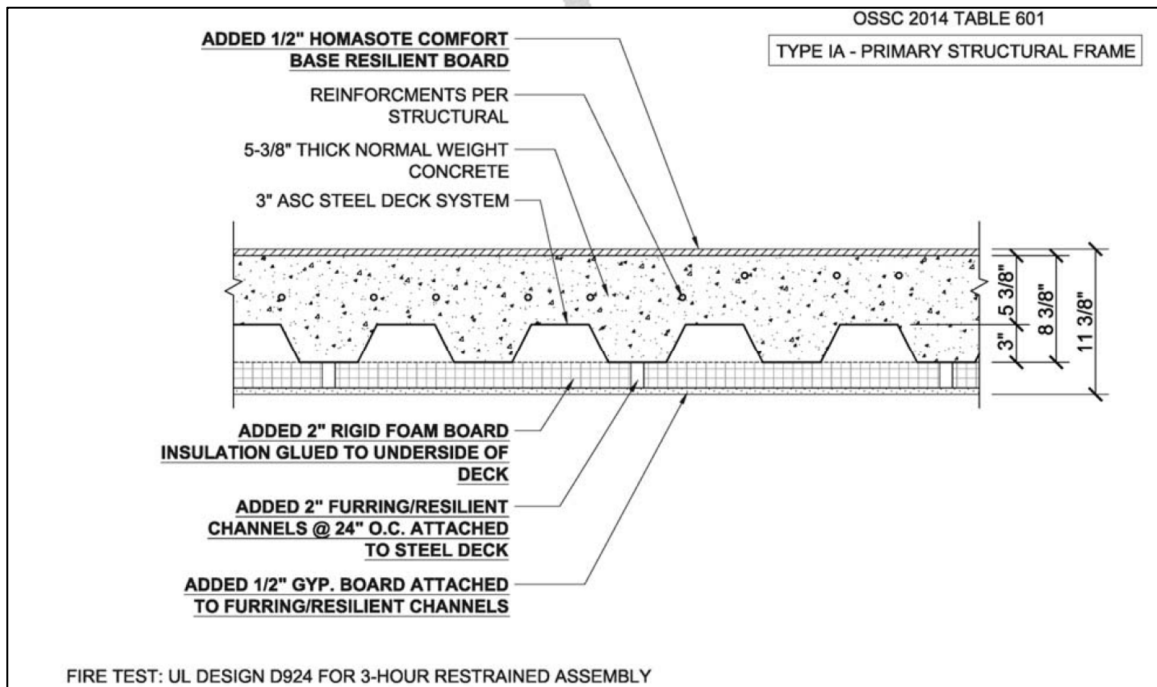
**Re: HUB Apartments – Floor/Ceiling Assembly Review**

**Introduction:**

Acoustics By Design (ABD) has been requested to review the Proposed Alternate floor/ceiling assembly between units for the HUB Apartments. Laboratory test data for the alternate assembly is not available. This report details the evaluation of the STC and IIC ratings for Proposed Alternate assembly based on similar laboratory tested assemblies and the basis for the ratings.

**Proposed Alternate Assembly**

The Proposed Alternate assembly is indicated in Figure 1.



**Figure 1 – Propose Alternate Assembly.**

We note that the assembly indicates 2" furring/resilient channels in lieu of standard 7/8" resilient channels as well as 2" rigid foam insulation. We understand that based on the depth of 2", rigid channels will be used.

## **Analysis**

### **Tested Assemblies**

Given that there are no laboratory tests for the Proposed Alternate assembly, we have found laboratory test data for assemblies with similar construction as follows.

#### **Versa-Dek 2**

- 5-1/8" concrete topping on 2" steel deck with concrete between the flutes (57 psf)
- 20 ga. Versa-Dek 2 steel deck
- ClarkDietrich RS Deluxe resilient furring channels, 24" o.c. attached perpendicular to the deck flutes
- (1) layer 1/2" Type C gypsum wallboard.

This assembly has an STC rating of 52 (NGC 5006083). We did not include the IIC rating for this assembly with the Homasote ComfortBase on top of the concrete. After contacting Homasote directly for more test reports on similar assemblies, we were notified that the ComfortBase resilient board is no longer available and was discontinued a year ago. The current installation method for a similar Homasote product requires mechanical fasteners which negate the resiliency and reduce the IIC. Homasote does not have test data of an assembly with the current recommended installation.

#### **Concrete Metal Deck**

- 3" normal-weight concrete topping on 3" metal deck (56 psf)
- Resilient channels, 16" o.c.
- (2) layers of 1/2" Type C gypsum wallboard

This assembly has a rating of STC 57 (NRCC TLF-97-101a) and an IIC of 36 (NRCC IIF-97-049) with resilient channels and gypsum wallboard. The concrete metal deck alone is STC 51 (NRCC TLF-97-101a) and IIC 21 (IIF-97-045). The addition of the resilient channels with 2 layers of gypsum wallboard increased the STC by 4 points and the IIC by 15 points.

#### **Concrete Slab**

- 6" normal-weight concrete slab (75 psf)

This assembly has a rating of STC 53 (NRCC TLF-11-040), and IIC 29 (NRCC IIF-11-033).

## **Comparison to Proposed Alternate Assembly STC**

The Proposed Alternate has 5-3/8" concrete topping on a 3" metal deck and (1) layer 1/2" gypsum wallboard on 2" furring channel. Assuming normal-weight concrete, we estimate the mass of the concrete to be a minimum of 75 psf. With the 2" furring channel rigidly attached to the deck and rigid insulation in the cavity, the increase in STC due to the 1/2" layer of gypsum would be minimal since the concrete dominates the STC performance of the assembly. Based on this we rate the Proposed Assembly to have an STC 53-54.

## **IIC**

Given that there is no tested assembly with the current version of Homasote ComfortBase that is installed with mechanical fasteners, we estimate the IIC of the Proposed Alternate to be similar to a 6" thick concrete slab with the 1/2" gypsum wallboard and rigid foam insulation in the cavity to be at IIC 29.

## **Recommendations**

To increase the IIC above 50, we recommend one of the following acoustical underlayments that can be used with Luxury Vinyl Tile. These underlayments were tested on a 6" slab with a surface weight of 75 psf similar to the estimated weight of the Proposed Alternate assembly. The IIC rating and test numbers are included with each product.

- Jumpax by Sound Seal – IIC 51 (Intertek 3169380CRT-002b)
- Isolymt QT-F05 by Kinetics Noise Control – IIC 53 (NGC 7007066)
- RST-05 by Pliteq – IIC 53 (NRCC B3498.2)

Adding a layer of 1/2" gypsum wallboard attached to the deck with a 25 gauge channel and unfaced batt insulation in the cavity will only increase the STC and IIC ratings above the ratings listed in the previous sections.

**Conclusions**

We have reviewed laboratory tested assemblies that closely match the Proposed Alternate assembly. We rate the assembly at STC 53-54 and a minimum of IIC 51 with the appropriate underlayment.

This evaluation only addresses the acoustical properties of the assembly. Other items, such as structural, security, and safety concerns are to be addressed by others. If you have any questions, please call.

Sincerely,  
ACOUSTICS BY DESIGN, INC.  
Per:



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*Senior Acoustical Consultant*

cc: Kenric Van Wyk, Marci Boks, Acoustics By Design



EXPIRES: 12/31/16